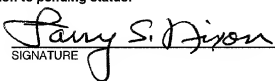


FORM PTO-1390 (REV 11-98)	U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE	ATTORNEY'S DOCKET NUMBER 36-1387
TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A FILING UNDER 35 U.S.C. 371		U.S. APPLICATION NO. (If known, see 37 C.F.R. 1.5) 09/719982 Unknown
INTERNATIONAL APPLICATION NO. PCT/GB99/02242	INTERNATIONAL FILING DATE 14 July 1999	PRIORITY DATE CLAIMED 17 July 1998
TITLE OF INVENTION TELECOMMUNICATIONS MESSAGING SYSTEMS		
APPLICANT(S) FOR DO/EO/US LOBLEY et al		
Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:		
1. <input checked="" type="checkbox"/> This is a FIRST submission of items concerning a filing under 35 U.S.C. 371. 2. <input type="checkbox"/> This is a SECOND or SUBSEQUENT submission of items concerning a filing under 35 U.S.C. 371. 3. <input checked="" type="checkbox"/> This is an express request to begin national examination procedures (35 U.S.C. 371(f) at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371(b) and PCT Articles 22 and 39(1). 4. <input checked="" type="checkbox"/> A proper Demand for International Preliminary Examination was made by the 19 th month from the earliest claimed priority date. 5. A copy of the International Application as filed (35 U.S.C. 371(c)(2)). a. <input checked="" type="checkbox"/> is transmitted herewith (required only if not transmitted by the International Bureau). b. <input type="checkbox"/> has been transmitted by the International Bureau. c. <input type="checkbox"/> is not required, as the application was filed in the United States Receiving Office (RO/US). 6. <input type="checkbox"/> A translation of the International Application into English (35 U.S.C. 371(c)(2)). 7. <input type="checkbox"/> Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3)). a. <input type="checkbox"/> are transmitted herewith (required only if not transmitted by the International Bureau). b. <input type="checkbox"/> have been transmitted by the International Bureau. c. <input type="checkbox"/> have not been made; however, the time limit for making such amendments has NOT expired. d. <input type="checkbox"/> have not been made and will not be made. 8. <input type="checkbox"/> A translation of the amendments to the claims under PCT Article 19 (U.S.C. 371(c)(3)). 9. <input checked="" type="checkbox"/> An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)). 10. <input type="checkbox"/> A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)). Items 11. To 16. Below concern document(s) or information included: 11. <input type="checkbox"/> An Information Disclosure Statement under 37 C.F.R. 1.97 and 1.98. 12. <input checked="" type="checkbox"/> An assignment document for recording. A separate cover sheet in compliance with 37 C.F.R. 3.28 and 3.31 is included. 13. <input checked="" type="checkbox"/> A FIRST preliminary amendment. <input type="checkbox"/> A SECOND or SUBSEQUENT preliminary amendment. 14. <input type="checkbox"/> A substitute specification. 15. <input type="checkbox"/> A change of power of attorney and/or address letter. 16. <input type="checkbox"/> Other items or information.		

U.S. APPLICATION NO. 14-1140 (37 C.F.R. 1.5) 09/01/9982	INTERNATIONAL APPLICATION NO. PCT/GB99/02242	ATTORNEY'S DOCKET NUMBER 36-1387
17. <input checked="" type="checkbox"/> The following fees are submitted:		CALCULATIONS PTO USE ONLY
BASIC NATIONAL FEE (37 C.F.R. 1.492(a)(1)-(5)): -- Neither international preliminary examination fee (37 C.F.R. 1.482) nor international search fee (37 C.F.R. 1.445(a)(2)) paid to USPTO and International Search Report not prepared by the EPO or JPO \$1000.00 -- International preliminary examination fee (37 C.F.R. 1.482) not paid to USPTO but International Search Report prepared by the EPO or JPO \$860.00 -- International preliminary examination fee (37 C.F.R. 1.482) not paid to USPTO but international search fee (37 C.F.R. 1.445(a)(2)) paid to USPTO \$710.00 -- International preliminary examination fee paid to USPTO (37 C.F.R. 1.482) but all claims did not satisfy provisions of PCT Article 33(1)-(4) \$690.00 -- International preliminary examination fee paid to USPTO (37 C.F.R. 1.482) and all claims satisfied provisions of PCT Article 33(1)-(4) \$100.00		
ENTER APPROPRIATE BASIC FEE AMOUNT =		\$ 860.00
Surcharge of \$130.00 for furnishing the oath or declaration later than <input type="checkbox"/> 20 <input type="checkbox"/> 30 months from the earliest claimed priority date (37 C.F.R. 1.492(e)).		\$ 0.00
CLAIMS	NUMBER FILED	NUMBER EXTRA
Total Claims	12	-20 =
Independent Claims	2	-3 =
		0
		X
		\$18.00
		\$ 0.00
		\$ 0.00
MULTIPLE DEPENDENT CLAIMS(S) (if applicable)		\$270.00
TOTAL OF ABOVE CALCULATIONS =		\$ 860.00
Reduction by 1/2 for filing by small entity, if applicable. A Small Entity Statement must also be filed (Note 37 C.F.R. 1.9, 1.27, 1.28).		0.00
SUBTOTAL =		\$ 860.00
Processing fee of \$130.00, for furnishing the English Translation later than <input type="checkbox"/> 20 <input type="checkbox"/> 30 months from the earliest claimed priority date (37 C.F.R. 1.492(f)).		0.00
TOTAL NATIONAL FEE =		\$ 860.00
Fee for recording the enclosed assignment (37 C.F.R. 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 C.F.R. 3.28, 3.31). \$40.00 per property +		\$ 40.00
Fee for Petition to Revive Unintentionally Abandoned Application (\$1240.00 - Small Entity = \$620.00)		\$ 0.00
TOTAL FEES ENCLOSED =		\$ 900.00
		Amount to be: refunded \$
		Charged \$
a. <input checked="" type="checkbox"/> A check in the amount of \$900.00 to cover the above fees is enclosed. b. <input type="checkbox"/> Please charge my Deposit Account No. 14-1140 in the amount of \$_____ to cover the above fees. A duplicate copy of this form is enclosed. c. <input checked="" type="checkbox"/> The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. 14-1140. A duplicate copy of this form is enclosed. d. <input checked="" type="checkbox"/> The entire content of the foreign application(s), referred to in this application is/are hereby incorporated by reference in this application.		
NOTE: Where an appropriate time limit under 37 C.F.R. 1.494 or 1.495 has not been met, a petition to revive (37 C.F.R. 1.137(a) or (b)) must be filed and granted to restore the application to pending status.		
SEND ALL CORRESPONDENCE TO: NIXON & VANDERHYTE P.C. 1100 North Glebe Road, 8 th Floor Arlington, Virginia 22201 Telephone: (703) 816-4000		
 SIGNATURE		
Larry S. Nixon NAME		
25,640 REGISTRATION NUMBER		December 19, 2000 Date

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of

LOBLEY et al

Atty. Ref.: 36-1387

Serial No. Unknown

Group:

National Phase of PCT/GB99/02242

Filed: December 19, 2000

Examiner:

For: **TELECOMMUNICATIONS MESSAGING SYSTEMS**

* * * * *

December 19, 2000

Assistant Commissioner for Patents
Washington, DC 20231

Sir:

PRELIMINARY AMENDMENT

Prior to calculation of the filing fee and in order to place the above identified application in better condition for examination, please amend the claims as follows:

IN THE CLAIMS

Claim 5, lines 1 and 2, delete "claims 1 to 4" and insert -- claim 1 --.

Claim 12, line 1, delete "any of claims 8 to 11" and insert -- claim 8 --.

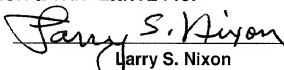
REMARKS

The above amendments are made to place the claims in a more traditional format.

Respectfully submitted,

NIXON & VANDERHYE P.C.

By:


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Telecommunications Messaging Systems

The invention relates to voicebank and other messaging applications in telecommunications systems. Such applications are now becoming commonplace, allowing communication to be made between a calling party and a called party without the need for both to be available simultaneously. A called party may be unable or unwilling to answer the telephone when a call is made, for example because he does not wish to be disturbed, or he is not present. In such circumstances a voicebank system can be used to divert incoming calls to a messaging service, which comprises a data store in which a message can be left for subsequent retrieval by the party for whom the call was intended.

Some voicebank systems are provided as part of the telephone terminal equipment, (so-called "telephone answering machines") but, increasingly, network operators are providing the facility as part of the network itself. This reduces terminal complexity, and allows messages to be left even when connection to the destination terminal is not possible, for example because it is engaged on another call or, (if it is a mobile terminal) because it is out of radio range of a base station or is switched off.

Systems operating on the same basic principles are also known for storing data messages (for example facsimile transmissions) when the destination terminal is unavailable, for subsequent retrieval by the called party. In the following specification, the term "message bank" will be used to cover any such service, whether storing voice or data messages. It is envisaged that any type of message, for example data or video, may be sent according to the system of the invention, according to the capabilities of the terminal equipment used.

In a typical message bank system, a calling party, on being connected to the message bank system, receives a prompt inviting the caller to leave a message. In a voicebank system, the prompt is generally a spoken message, which may be a recording or may have been generated synthetically. For a facsimile message the prompt is the "handshake" code transmitted by the receiving machine to prompt the calling facsimile machine to transmit at a rate which does not exceed the capabilities of the receiving machine. Any message transmitted by the calling party is stored in the message bank. The message may be stored in any suitable form. Network-based systems generally store the messages in digital form,

as do some terminal-based systems, but many terminal-based voicebank systems use magnetic tape to record an analogue signal.

When the called party wishes to access his message bank, he transmits a command to the message bank system. For a terminal-based system, this merely
 5 requires appropriate keypad commands on the terminal equipment. If the system is network-based, the command must include information to identify which user is calling. For many network-based systems this information is generated automatically, using calling line identity (CLI), or identification codes such as the user identity code (IMSI) which identifies the SIM (subscriber identity module) of a
 10 mobile terminal operating according to the GSM (Global System for Mobile communications) standard. Control of the system requires specific commands, such as "play next message", "repeat this message", "delete message" to be transmitted. These are generally transmitted to the network functionality using key-entry commands, which are transmitted using DTMF (dual tone multiple
 15 frequency) codes or the like.

It is known for example from International Patent Specification WO96/32802 (Siemens) to provide a communications system comprising

transmission means for transmitting a message from a remote terminal for storage in a message storage means, and/or transmitting a message retrieved from
 20 a message storage means to a remote terminal,

transmission means for transmitting, over a relatively narrow bandwidth communications link, control signals for controlling the operation of the message storage means, and

network control means for establishing a relatively broad bandwidth
 25 communications link for transmission of the message to or from the message storage means.

Network capacity is a scarce resource, particularly with the increasing demand for high-bandwidth services such as high-speed data and real-time video services. Analogue speech channels also require a wide bandwidth. It is therefore
 30 desirable to avoid the unnecessary allocation of bandwidth when it is not required for the service requested.

According to the invention, a communications system of this type is characterised in that the network control means is arranged to establish a one-way

broad bandwidth communications link in the direction in which the message is to be transmitted.

The invention may be used with network-based message banks or terminal-based message banks.

- 5 In a preferred arrangement the relatively broad bandwidth communications link is a traffic channel suited to the nature of the message to be stored (voice, data etc) whilst the relatively narrow bandwidth communications links are out-of-band signalling channels. This arrangement reduces the network resources required to operate the system. Separation of the control signals from the channel carrying
- 10 the message itself allows the use of a simplex (one-way) channel for the relatively broad bandwidth message-carrying channel. By eliminating the need for the return channel, network capacity can be improved. The one-way channel may also carry any control signals to be transmitted in the same direction, which in turn allows the use of a simplex narrow-bandwidth channel to be used for control signals in
- 15 the reverse direction.

- The invention may comprise means for identifying whether the remote terminal requires transmission and/or receipt of control signals over a relatively broad bandwidth communications link in the direction contrary to that in which the message is to be transmitted, and can be arranged to establish a one-way broad
- 20 bandwidth link if the said terminal does not require such a broad bandwidth link in the reverse direction, and to establish a two-way broad bandwidth link if the said terminal requires such a broad bandwidth link. The invention may further comprise means to convert the two-way broad bandwidth link to a one-way broad bandwidth link during the course of a call should the requirement for a broad
- 25 bandwidth link in the reverse direction cease. The invention may alternatively comprise means to reverse the sense of the one-way broad bandwidth communications link during the progress of a call.

- The invention also extends to telecommunications terminal equipment for use with the system defined above, comprising means for receiving said control
- 30 signals over a relatively narrow band channel, and converting said control signals into prompt signals readable by the person or machine transmitting or receiving the message. Such terminal equipment may be the message storing terminal, or the terminal by which the message storing service is accessed to send or retrieve messages.

According to a further aspect, the invention comprises a method of transmitting a message from a remote terminal to a message storage means, or retrieving a message from a message storage means, over relatively broad bandwidth communications links, wherein signals for controlling the operation of the message bank system are transmitted over relatively narrow bandwidth communications links, characterised in that a one-way broad bandwidth communications link is established in the direction in which the message is to be transmitted.

The invention is suitable for message deposit and for message retrieval, provided in each case that the terminal used allows the processing of out-of-band signalling. For message retrieval the relatively broad bandwidth link used for transmitting the requested messages can also be used for transmitting voice prompts and the like. However, for message deposit to be carried out in this way, the originating terminal requires a facility for processing and displaying prompts and other signals received from the network in the out-of-band format. As the system is preferably compatible with existing terminals and networks (including the traditional Public Switched Telephone Network (PSTN)) it will not always be possible to operate message deposit in this way. In appropriate circumstances the invention may be used to support only message deposit, or only message retrieval. It may also be used selectively, operating in a mode according to the invention only in respect of suitable terminals, and/or only in respect of message retrieval, being used in a second, conventional, mode otherwise.

Embodiments of the invention will now be described, by way of example only, with reference to the drawings, in which:

Figure 1 is a schematic diagram showing the general arrangement of a message-bank system in which messages are stored in a conventional manner;

Figure 2 is a schematic diagram showing the general arrangement of a message-bank system in which messages are stored in a manner operating according to the invention

Figure 3 is a diagram illustrating the operation of the system of Figure 2.

Figure 4 is a diagram illustrating an alternative method of operation of the system of Figure 2.

Figure 5 is a schematic diagram showing the general arrangement of a message-bank system in which messages are retrieved in a conventional manner;

Figure 6 is a schematic diagram showing the general arrangement of a message-bank system in which messages are retrieved in a manner operating according to the invention.

Figure 7 is a diagram illustrating the operation of the system of Figure 6.

5 In Figures 1, 2, 5 and 6 there is shown a message bank 1. In the preferred embodiment this is a network-based message bank, but in Figures 1 and 2 it may instead be a terminal-based system, more commonly known as an "answering machine". In such systems, of course, retrieval takes place at the user's terminal, without the use of the network. The messaging system is connected through a telecommunications network 2 to a terminal 3. In Figures 1 and 2 this is the terminal used by the calling party to leave a message, whereas in Figures 5 and 6 it is the terminal used by the called party to retrieve the message. The connection 4, 5 is capable of supporting the message in the format in which it is transmitted (speech, broadband data, etc) and is a conventional duplex link 4 in Figures 1 and 10 5. In Figure 2 it is a simplex (one-way) link 5 from the terminal 3 to the message bank 1, whilst in Figure 6 it is a simplex (one-way) link 6 in the converse direction. An "out-of-band" signalling channel 7 is also shown in the Figures. This signalling channel 7 may in practice be the signalling channel used in initially setting up the call; however in Figures 2 and 6 separate simplex signalling channels (operating in 20 the sense indicated) may be employed for the additional signalling to be discussed with reference to those figures. The network 2 is controlled by a network control system 8 which is typically an "Intelligent Network" (IN) platform.

In the prior art arrangement shown in Figure 1, the voice messaging system operates as follows. When a call is set up over a telecommunications 25 system, the network control system 8 first sets up a signalling connection 7, which provides the various call set-up functions including the provision of ringing tone, etc. When the called party answers, this is recognised by the network control system 8 which sets up a full telephone connection 2. In the arrangement of Figure 1, when a caller 3 attempts to make a telephone call, the network control 30 system 8 diverts the call through the network 2 to the message bank 1. This may occur because the called party has set up the diversion manually. Alternatively, the settings of the network control system 8 may cause automatic diversion if the called party's telephone does not respond, is busy on another call, is switched off or (for a mobile telephone) is out of range of the base station network. Network-

based message banks 1 have separate addresses for each telephone served by the network, and calls to the message bank 1 are routed to the address corresponding to the called number.

The network control system 8, on connection of a telephone 3 to an address in the message bank 1, first establishes a signalling link 7. If the call is connected, a conventional telephone connection 4 is set up over the network, over which prompts are sent to the caller 3 from the message bank 1, inviting the caller 3 to leave a message. These prompts are conventionally in the form of synthesised or recorded speech, suitable for the telephone connection. The calling party 3 can then transmit a spoken message over the connection 4 for storage in the appropriate address of the message bank 1, for subsequent retrieval.

If the calling party 3 is a facsimile machine or computer modem, the nature of the signals to be stored in the message bank 1 will be different, and in order to correctly co-operate with the calling party 3, the prompts transmitted from the message bank have to be appropriate. For example, a human listener cannot interpret or generate the speech-band signals used to control facsimile machines. Similarly, facsimile machines and modems will not respond to voice prompts. The selection of the appropriate prompt can be achieved by having separate message bank facilities for speech and data, requiring diversion to different numbers. Alternatively, a single message bank 1 may be made capable of identifying the various "handshake" signals generated by different types of calling device, and transmitted over the telephone connection 2 when first set up. In response, the message bank 1 transmits a prompt of the type appropriate to the type of caller.

Figure 5 shows the message retrieval process for a conventional message bank system. When a user 3 wishes to access the message bank, he dials a number to establish a conventional telephone connection 4 to the message accessing function of the message bank 1. The message bank 1 may identify the user's individual address within the message bank 1 by using calling line identity (CLI) signals transmitted over the signalling connection 7 during call set-up. The message bank 1 next transmits a prompt to the user over the newly-established telephone connection 4. The format of this prompt may be a voice message, or a facsimile or modem "handshake", depending on the nature of the messages stored in the message bank, and/or the nature of the terminal 3 making the call. If the desired message bank address has not already been identified by CLI, as described

above, this prompt may request the user 3 to identify the address required. This allows a user to access his message bank. Password protection may be used to avoid unauthorised access.

The user may control the playback of messages stored in the message bank 1 using commands transmitted from his terminal 3 over the telephone connection 4. For example a user may wish to list the messages (by time, calling number, or other characteristics), play a message from the list (next, previous etc), or delete a message. The control commands are typically transmitted as DTMF (dual tone multiple frequency) signals over the telephone connection 4.

10 The system according to the invention will now be described with reference to Figures 2, 3, 4, 6 and 7. As has been described above, the invention is primarily concerned with message retrieval, but it may also be used for message deposit and this will be described first, with reference to Figures 2 and 3.

When an incoming call is routed to the message deposit function of the message bank 1, (step 31, Figure 3) the network control system 8 identifies that
15 the called party is a message bank (step 32) and establishes a one-way (simplex) telephone connection 5 to the message bank (step 33). No channel is established in the reverse direction, apart from the signalling connection 7 established during the initial call set-up process 31/32. Since channels are generally allocated in pairs
20 (e.g. frequency pairs in radio communications, wire pairs in fixed networks), simplex operation releases the partner channel for other purposes. If the calling party 3 is a mobile telephone, it may be connected to the radio base station using an uplink radio channel which would otherwise be unusable, for example because the signal quality on the corresponding downlink channel is below acceptable
25 limits. In the more general case, where both paths are usable, they may be used to provide two independent simplex links. In particular, there are network paths which, if used as conventional duplex paths, would suffer from echo (the return on one path of a signal transmitted on the other, resulting from acoustic or electrical feedback between the two channels). Parts of these paths may nevertheless be
30 usable as independent simplex links, as the connection from which the feedback would have originated would not form part of both links.

Unlike the prior art arrangement of Figure 1, the prompts that are sent from the message bank 1 to the user 3 (step 34) are carried in out-of-band signalling using the signalling channel 7. This requires that the calling party 3 is

able to read and process such signals (step 35). This may be achieved by using specialised terminal equipment 3 capable of operating with such signalling. Alternatively, the out-of-band signals may be converted to conventional in-band prompts at some intermediate point in the network. This intermediate point may be the local exchange (or mobile switching centre for a mobile telephone) to which the user terminal 3 is connected - in this case the connection between that intermediate point and the user 3 would then be by conventional duplex link.

The network control system 8 may recognise whether the terminal 3 is of a type suitable for handling such out-of-band prompts, and establish a link 4,5 of appropriate type (simplex or duplex) accordingly, either between the user terminal 3 and the intermediate point (the rest of the link to the message bank being simplex), or throughout between the user terminal 3 and the message bank 1.

The prompts may control a display to give instructions to the user of the terminal 3. The terminal 3 may convert the prompts into instructions (voice or visual display), for example telling the user when to speak. In the case of a facsimile or computer modem connection, the prompt may control the machine at the terminal 3 to cause it to transmit its data, for example using "Internet Protocol" (IP). The message to be stored can then be transmitted (step 38) over the simplex link 5 to be stored (step 39) in the message bank 1.

The message bank 1 may be customer-provided terminal equipment, or it may be associated with the network equipment 2.

In an alternative arrangement, illustrated in Figure 4, the network control system 8 initially sets up a conventional duplex broad bandwidth link 4 (step 42) in response to the call set-up request (41). The message bank 1 sends the "prompt" message (step 44) over the "down" (message bank to caller) leg of this duplex link 4. The message bank 1 then sends a command 46 to the network control system 8 to drop the "down" leg, (step 47) to leave only the "up" leg, thereby forming a simplex link 5 in the "up" direction. The caller, on receiving the prompt (step 45), responds to it by sending his message (step 48) over the simplex link 5 to be received by the message bank 1 (step 49).

Instead of establishing a full duplex link 4 and then dropping one leg of it, a time division duplex arrangement may be employed, as also illustrated in Figure 4. In this process the network control system 8 initially sets up (step 42) a simplex link 6 from the message bank 1 to the user terminal 3. This is used to send the

prompt (step 44), and then the direction of the simplex link is reversed (step 47) to create a simplex link 5 over which the message can be transmitted.

Message retrieval operates in the manner illustrated in Figures 6 and 7. When a user 3 accesses the message facility 1 (step 71), the network control, system 8 first sets up a signalling connection 7. The message facility 1 may use calling line identity to identify which messaging address is required, and whether the calling terminal has the out-of-band signalling capacity (step 72). A simplex voiceband connection 6 is then set up from the message bank 1 to the terminal 3 (step 73), and prompts are transmitted over this connection to the user (step 74). The user, on receiving such prompts (step 75) responds with signals entered on the keypad or other data entry device of his terminal 3 (step 76), and these are transmitted over the signalling connection 7 to control the further operation of the message bank 1 (step 77), and in particular to cause it to transmit selected messages (step 78) over the wide bandwidth link 6 to be received by the user 3 (step 79).

Although messages may be sent from any terminal for deposit in the message bank, the terminal 3 used to retrieve messages is generally the user's own terminal, which can be designed to be compatible with the network with which it operates. In particular, it can be provided with the means to generate out-of-band signals. However, as already mentioned, a user may use other terminals 3 to access his message facility 1 (subject to password control, etc), and such other terminals may not all have the out-of-band signalling facility. In such cases conventional duplex provision may need to be provided for all or part of the connection through the network 2. This may take the form of conversion at some point in the network 2 between DTMF tones and out-of-band signals. The selection of simplex or duplex operation may be made by the network control system 8 during the call set-up process, by monitoring the signals sent over the signalling channel 7 by the terminal 3 (step 72). This may be done either by identifying the terminal as simplex-compatible from its calling line identity, or by assessing whether it responds to the first prompt sent to it by transmitting an in-band signal (thereby signifying a duplex connection is required) or an out-of-band signal (signifying it is suitable for operation in simplex mode).

As discussed above, the message bank 1 may be customer-provided terminal equipment, or it may be associated with the network equipment 2, for

example at a switch. In the former case, of course, network facilities are only required for retrieval if the messages are being accessed remotely, from another terminal 3.

- The out-of-band signals used may be according to any suitable protocol, such as "CLASS" or "Internet Protocol" (IP). The invention is particularly suited for use in multi-media networks, which have advanced add/drop bearer capabilities to allow asymmetric data transfer.

CLAIMS

1. A communications system comprising
 - 5 transmission means (2) for transmitting a message from a remote terminal (3) for storage in a message storage means (1), and/or transmitting a message retrieved from a message storage means (1) to a remote terminal (3),
 - transmission means (2) for transmitting, over a relatively narrow bandwidth communications link (7), control signals for controlling the operation of the
 - 10 message storage means (1), and
 - network control means (8) for establishing a relatively broad bandwidth communications link (5) for transmission of the message to or from the message storage means (1)
 - characterised in that the network control means (8) is arranged to establish
 - 15 a one-way broad bandwidth communications link (5) in the direction in which the message is to be transmitted.
2. A communications system according to claim 1, the network control means (8) being arranged to identify whether the remote terminal (3) requires transmission
 - 20 and/or receipt of control signals over a relatively broad bandwidth communications link in the direction contrary to that in which the message is to be transmitted: and arranged to establish said one-way broad bandwidth link (5) if the said terminal does not require such a broad bandwidth link in the reverse direction, and to establish a two-way broad bandwidth link (4) if the said terminal (3) requires
 - 25 transmission of control signals over such a broad bandwidth link.
3. A communications system according to claim 2, the network control means (8) further comprising means to convert the said two-way broad bandwidth link (4) to a one-way broad bandwidth link (5) during the course of a call when the
 - 30 requirement for a broad bandwidth link in the reverse direction ceases.
4. A communications system according to claim 3, wherein the control means (8) comprises means to reverse the sense of the one-way broad bandwidth communications link (5) during the progress of a call.

5. Telecommunications equipment (1,3) for use with the system of claims 1 to 4, comprising means for receiving said control signals over a relatively narrow band channel (7), and converting said control signals into visible or audible prompt signals readable by the human or machine transmitting or receiving the message.

6. Telecommunications equipment according to Claim 5, being a message storing terminal (1).

7. Telecommunications equipment according to Claim 5, being a terminal (3) by means of which a message storing service can be accessed to send or retrieve messages.

8. A method of transmitting a message from a remote terminal (3) to a message storage means (1), or retrieving a message from a message storage means (1), over relatively broad bandwidth communications links (5), wherein signals for controlling the operation of the message bank system are transmitted over relatively narrow bandwidth communications links (7) and characterised in that a one-way broad bandwidth communications link (5) is established in the direction in which the message is to be transmitted.

9. A method according to claim 8, wherein it is determined whether the remote terminal requires transmission and/or receipt of control signals over a relatively broad bandwidth communications link in the direction contrary to that in which the message is to be transmitted; and said one-way broad bandwidth link (5) is established if the said terminal does not require such a broad bandwidth link in the reverse direction, and a two-way broad bandwidth link (4) is established if the said terminal requires such a broad bandwidth link.

10. A method according to claim 9, wherein said two-way broad bandwidth link (4) is converted to a one-way broad bandwidth link (5) during the course of a call when the requirement for a broad bandwidth link in the reverse direction ceases.

11. A method according to claim 8, wherein the sense of the one-way broad bandwidth communications link (5) is reversible during the progress of a call.

12. A method according to any of claims 8 to 11, wherein said control signals
5 received over a relatively narrow band channel (7) are converted into visible or audible prompt signals readable by the human or machine transmitting or retrieving the message.

ABSTRACT

Telecommunications Messaging Systems

5 A Message retrieval system is arranged to allow control functions to be carried in out-of-band signalling channels, thereby allowing a reduced bandwidth to be required for message storage and retrieval. In particular, storage or retrieval can be carried over a simplex broad bandwidth link, as no broad bandwidth signal is transmitted in the reverse direction.

10 When a user 3 accesses the message facility 1, a signalling connection 7 is first set up. The message facility 1 may use calling line identity to identify which messaging address is required, and whether the calling terminal has the out-of-band signalling capacity. A simplex voiceband connection 6 is then set up from the message bank 1 to the terminal 3, and prompts are transmitted over this
 15 connection to the user. The user, on receiving such prompts responds with signals entered on the keypad or other data entry device of his terminal 3, and these are transmitted over the signalling connection 7 to control the further operation of the message bank, and in particular to cause it to transmit selected messages (step 78) over the wide bandwidth link 6 to be received by the user 3.

20

Figure (6)

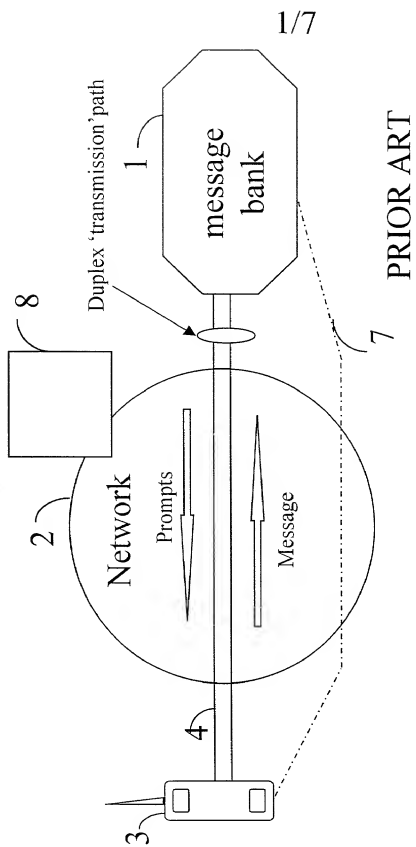


Figure 1

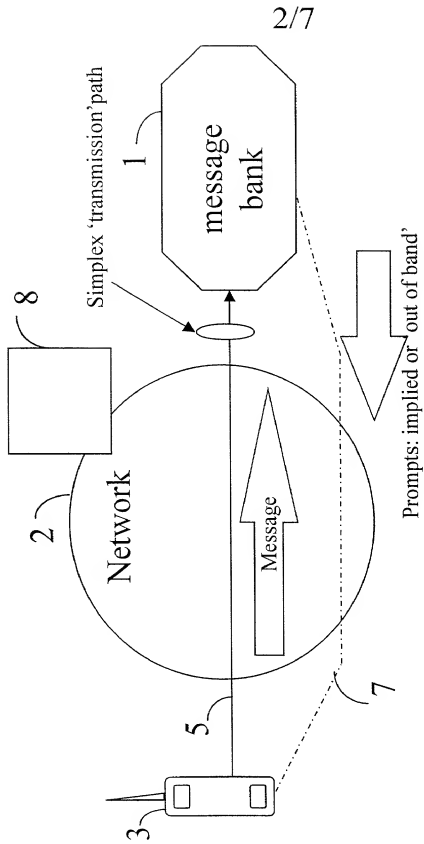


Figure 2

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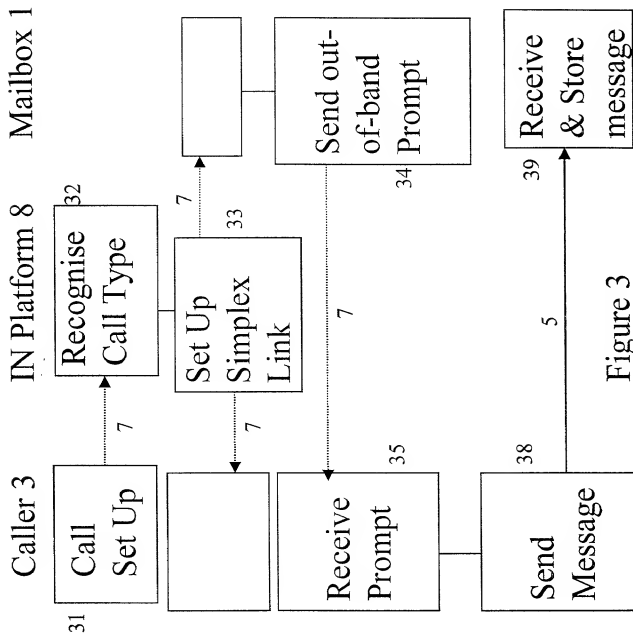


Figure 3

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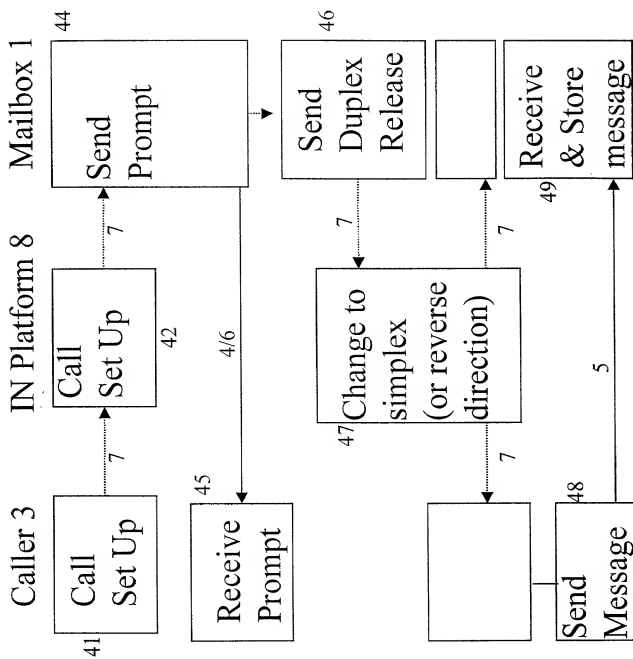


Figure 4

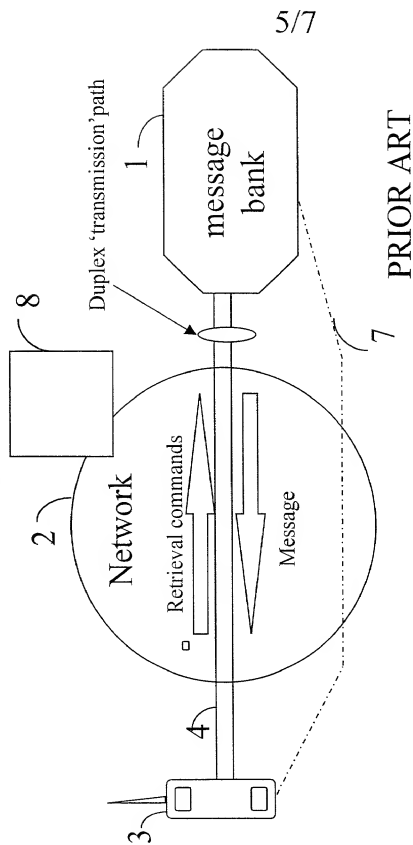


Figure 5

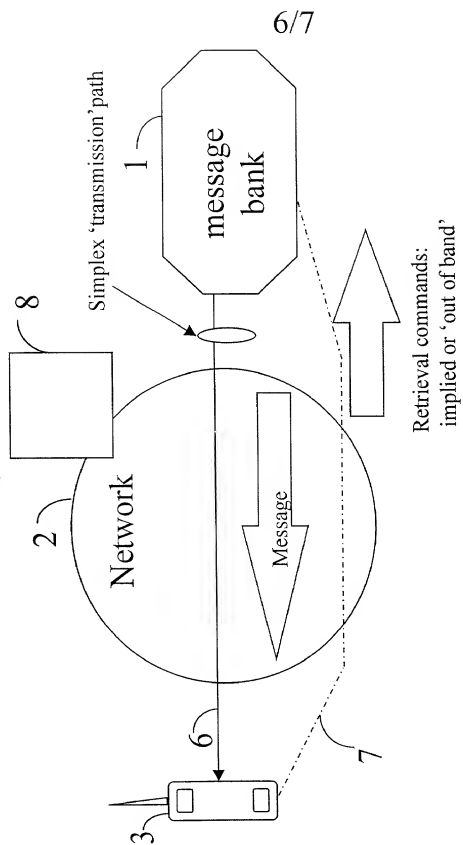


Figure 6

Mailbox 1

IN Platform 8

Caller 3

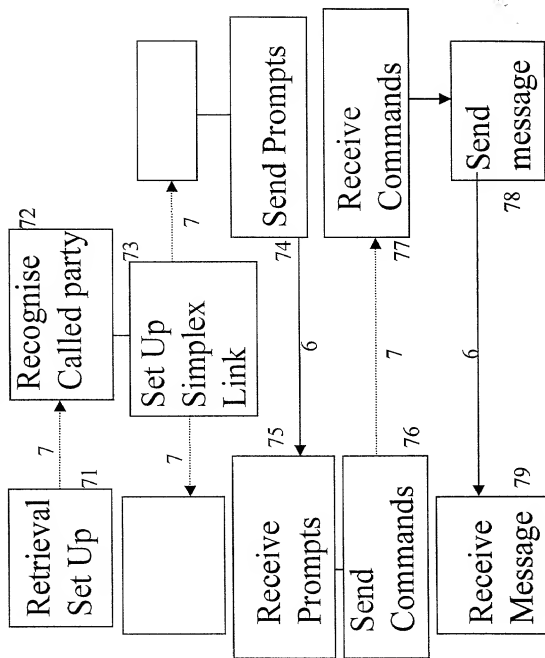


Figure 7

RULE 63 (37 C.F.R. 1.63)
DECLARATION AND POWER OF ATTORNEY
FOR PATENT APPLICATION
IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

As a below named inventor, I hereby declare that my residence, post office address and citizenship are as stated below next to my name, and I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled: **TELECOMMUNICATIONS MESSAGING SYSTEMS** the specification of which (check applicable box(es)):

☐ is attached hereto.

☐ was filed on _____ as U.S. Application Serial No. _____

☒ was filed as PCT international application No. **PCT/GB99/02242** on **14 July 1999** and (if applicable to U.S. or PCT application) was amended on _____

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above. I acknowledge the duty to disclose information which is material to the examination of this application in accordance with 37 C.F.R. 1.56. I hereby claim foreign priority benefits under 35 U.S.C. 119/365 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed or, if no priority is claimed, before the filing date of this application:

Prior Foreign Application(s):

Application Number	Country	Day/Month/Year Filed
98305725.8	EUROPE	17 JULY 1998
9815692.0	GREAT BRITAIN	17 JULY 1998

I hereby claim the benefit under 35 U.S.C. 119(e) of any United States provisional application(s) listed below.


Application Number _____ Day/Month/Year Filed _____

I hereby claim the benefit under 35 U.S.C. 120/365 of all prior United States and PCT international applications listed above or below and, insofar as the subject matter of each of the claims of this application is not disclosed in such prior applications in the manner provided by the first paragraph of 35 U.S.C. 112, I acknowledge the duty to disclose material information as defined in 37 C.F.R. 1.56 which occurred between the filing date of the prior applications and the national or PCT international filing date of this application:

Prior U.S./PCT Application(s):

Application Serial No.	Day/Month/Year Filed	Status: patented, pending, abandoned
PCT/GB99/02242	14 July 1999	PENDING

I hereby declare that all statements made herein of my own knowledge are true and that statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon. And I hereby appoint **NIXON & VANDERHYE P.C., 1100 North Glebe Road, 8th Floor, Arlington, VA 22201-4714**, telephone number **(703) 816-4000** (to whom all communications are to be directed), and the following attorneys thereof (of the same address) individually and collectively my attorneys to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith and with the resulting patent: **Arthur R Crawford, 25327; Larry S. Nixon, 25640; Robert A. Vanderhye, 27076; James T. Hosmer, 30184; Robert W. Faris, 31352; Richard G. Besh, 22720; Mark E. Nushbaum, 32348; Michael J. Keenan, 32106; Bryan H. Davidson, 30251; Stanley C. Spooner, 27393; Leonard C. Mitchard, 29009; Duane M. Byers, 33363; Paul J. Henon, 33626; Jeffrey H. Nelson, 30481; John R. Lastova, 33149; H. Warren Burnam Jr., 29366; Thomas E. Byrne, 32205; Mary J. Wilson, 32955; J. Scott Davidson, 33489; Alan M. Kagen, 36178; William J. Griffith, 31260; Robert A. Molan, 29834.**

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[] was filed on _____ as U.S. Application Serial No. _____
☒ was filed as PCT international application No. PCT/ GB99/02242 on 14 July 1999
 and (if applicable to U.S. or PCT application) was amended on _____

17 JULY 1998

Day/Month/Year Filed

PENDING

FOR ADDITIONAL INVENTORS, check box [X] and attach sheet with the same information and signature and date for each.